Claims

1. A ceramics honeycomb structure formed of a plurality of cells forming a fluid flow passage partitioned by porous partition walls, and comprising an inflow end part allowing fluid to flow therein, an outflow end part allowing fluid to flow therefrom, and an outer peripheral part including an outer peripheral surface, characterized by having a structure where a porosity per unit volume (cm^3) gradually increases from the inflow end part side to the outflow end part side at a rate of 0.2%/mm or less.

2. A ceramics honeycomb structure according to claim 1 which has a structure where the porosity per unit volume (cm^3) gradually increases from the inflow end part side to the outflow end part side at a rate of 0.1%/mm or less.

3. A ceramics honeycomb structure formed of a plurality of cells forming a fluid flow passage partitioned by porous partition walls, and comprising an inflow end part allowing fluid to flow therein, an outflow end part allowing fluid to flow therefrom and an outer peripheral part including an outer peripheral surface, characterized by having a structure where a porosity per unit volume (cm^3) gradually decreases from the central part of a section perpendicular to the flow passage direction of the cells to the outer peripheral part at a rate of 0.2%/mm or less.

4. A ceramics honeycomb structure according to claim 3 which has a structure where the porosity per unit volume (cm^3) gradually decreases from the central part of a section

perpendicular to the flow passage of the cells to the outer peripheral part at a rate of 0.1%/mm or less.

5. A ceramics honeycomb structure according to any one of claims 1-4, wherein a porosity per unit volume (cm^3) in the area of up to 150 mm from the flow passage end face of the inflow end part side in the inward direction of the flow passage is 10-50%.

6. A ceramics honeycomb structure according to any one of claims 1-5, wherein the minimum thickness of the partition walls is 0.030-0.076 mm.

7. A ceramics honeycomb structure according to any one of claims 1-6 which comprises at least one ceramics selected from the group consisting of cordierite, alumina, mullite, silicon nitride, aluminum titanate, zirconia and silicon carbide.

8. A ceramics honeycomb structure according to any one of claims 1-7, wherein the section perpendicular to the flow passage has a shape of circle, ellipse, oval, trapezoid, triangle, tetragon, hexagon or left and right asymmetric irregular shape.

9. A ceramics honeycomb structure according to any one of claims 1-8, wherein the section of the cells perpendicular to the flow passage has a shape of triangle, tetragon or hexagon.

10. A ceramics honeycomb structure according to any one of claims 1-9 which is used as automobile exhaust gas purification catalyst carriers.

11. A ceramics honeycomb structure according to any one

of claims 1-10 which has a catalyst component supported on the partition walls and is incorporated into a catalyst converter by being held at the outer peripheral surface of the outer wall.

12. A method for producing a ceramics honeycomb structure, characterized in that a dried substrate having a honeycomb structure is obtained using a clay mainly composed of a ceramics material, the resulting substrate is coated and impregnated with a reinforcing agent mainly composed of a compound having in its structure at least one element selected from the group consisting of Si, Ti, Mg and Al, and thereafter the substrate is fired.

13. A method for producing a ceramics honeycomb structure, characterized in that a dried substrate having a honeycomb structure is obtained using a clay mainly composed of a ceramics material, the substrate is fired to obtain a fired substrate, the resulting fired substrate is coated with and impregnated with a reinforcing agent mainly composed of a compound having in its structure at least one element selected from the group consisting of Si, Ti, Mg and Al, and thereafter the substrate is fired again.

14. A method for producing a ceramics honeycomb structure according to claim 12 or 13, wherein said compound is one which produces an inorganic oxide when it burns.

15. A method for producing a ceramics honeycomb structure according to any one of claims 12-14, wherein said compound has a siloxane bond.

16. A method for producing a ceramics honeycomb structure according to any one of claims 12-15, wherein said

compound is a silicone oil, a silicone varnish, an alkoxy oligomer or a mixture thereof.

17. A method for producing a ceramics honeycomb structure according to any one of claims 12-16, wherein the reinforcing agent has an absolute viscosity of 1-10000 mPa • s.

18. A method for producing a ceramics honeycomb structure according to any one of claims 12-17, wherein the ceramics material is a raw material convertible into cordierite.

19. A method for producing a ceramics honeycomb structure according to any one of claims 12-18, wherein the clay contains a water-soluble organic binder.

20. A method for producing a ceramics honeycomb structure according to claim 19, wherein the water-soluble organic binder comprises at least one water-soluble compound selected from the group consisting of hydroxypropylmethyl cellulose, methyl cellulose, hydroxyethyl cellulose, carboxymethyl cellulose, polyvinyl alcohol and polyvinyl acetal.